

FEATURES

- Solid state relay and AC input
- Optocoupler Package—Single 18 Pin
- I/O Isolation, 2500 VRMS
- Surface Mountable
- Optocoupler
 - Bidirectional Current Detection
- Solid-state Relay
 - Typical RON 25 W
 - Load Voltage 400 V
 - Load Current 100 mA
 - Current Limit Protection
 - High Surge Capability
 - Linear, AC/DC Operation
 - Clean Bounce Free Switching
 - Low Power Consumption
 - High Reliability Monolithic Receptor

Applications—General Telecom Switching

- On/off Hook Control
- Dial Pulse
- Ring Current Detection
- Loop Current Sensing

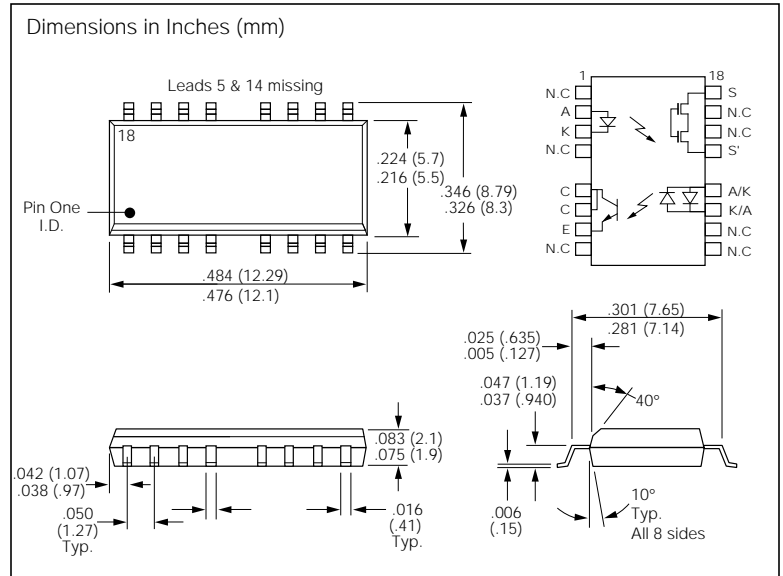
DESCRIPTION

The IL329 Telecom switch consists of an optically coupled solid state relay (SSR) and a bidirectional input optocoupler. The SSR is ideal for performing switchhook and dial-pulse switching while the optocoupler performs ring detection and loop current sensing functions. Both the SSR and opto coupler provide 2500 VRMS of input to output isolation.

The SSR is integrated on a monolithic receptor die using high voltage BCDMOS technology. The SSR features low ON-resistance, high breakdown voltage and current-limit circuitry that protects the relay from telephone line induced lightning surges.

The optocoupler provides bidirectional current sensing via two antiparallel GaAs infrared emitting diodes. The opto channel provides a minimum CTR of 33% at 6 mA.

The IL329 comes in a 18 pin, plastic surface mount package.



Absolute Maximum Ratings

Package

Ambient Temperature Range	-40 to +85°C
Storage Temperature Range	-40 to +150°C
Soldering Temperature (t=10 sec. max.)	260°C
Input/Output Isolation Voltage (t=60 sec. min.)	2500 V _{RMS}
Total Power Dissipation	500 mW
Isolation Test Voltage (between emitter and detector)	2500 VAC _{RMS}
Isolation Resistance	
V _{IO} =500 V, T _A =25°C	≥10 ¹² Ω
V _{IO} =500 V, T _A =100°C	≥10 ¹¹ Ω
Storage Temperature Range	-55°C to +125°C
Ambient Temperature Range	-55°C to +100°C
Soldering Temperature (max. ≤10 sec.,	
dip soldering ≥0.5 mm from case bottom)	260°C

SSR

LED Continuous Forward Current	50 mA
LED Reverse Voltage (I _R ≤10 μA)	5 V
DC or Peak AC Load Voltage (I _L ≤50 μA)	±400 V
Continuous DC Load Current	100 mA
Total Power Dissipation	350 mW

Optocoupler

LED Continuous Forward Current	±50 mA
Collector to Emitter Breakdown Voltage	30 V
Phototransistor Power Dissipation	150 mW

Electrical Characteristics ($T_A=25^\circ$)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Condition
SSR						
LED Forward Current for Switch Turn-on	I_{Fon}		0.2	0.5	mA	$I_L=100\text{ mA}$, $t=10\text{ ms}$
LED Forward Current for Switch Turn-off	I_{Foff}	0.001			mA	$V_L=\pm 350\text{ V}$
LED Forward Voltage	V_F	0.8	1.20	1.45	V	$I_F=1.5\text{ mA}$
ON-Resistance	R_{ON}	17	2.5	33	W	$I_F=1.5\text{ mA}$, $I_L=\pm 50\text{ mA}$
OFF-Resistance	R_{OFF}		5000		$G\Omega$	$I_F=0\text{ mA}$, $V_L=\pm 100\text{ V}$
Current Limit	I_{limit}	170	210	270	mA	$I_F=1.5\text{ mA}$, $t=5\text{ ms}$
Output Off-state Leakage Current			0.1	200	nA μA	$I_F=0\text{ mA}$, $V_L=\pm 100\text{ V}$ $I_F=0\text{ mA}$, $V_L=\pm 400\text{ V}$
Output Capacitance Pins 15 to 18			55 10		pF pF	$I_F=0\text{ mA}$, $V_L=1\text{ V}$ $I_F=0\text{ mA}$, $V_L=50\text{ V}$
Turn-on Time	T_{on}		1.0		ms	$I_F=1.5\text{ mA}$, $I_L=50\text{ mA}$
				0.8	ms	$I_F=5.0\text{ mA}$, $I_L=50\text{ mA}$
Turn-off Time	T_{off}		0.1		ms	$I_F=1.5\text{ mA}$, $I_L=50\text{ V}$
				0.2	ms	$I_F=5.0\text{ mA}$, $I_L=50\text{ mA}$
Optocoupler						
LED Forward Voltage	V_F	0.9	1.25	1.5	V	$I_F=10\text{ mA}$
DC Current Transfer Ratio	CTR	33	165		%	$I_F=6.0\text{ mA}$, $V_{CE}=0.5\text{ V}$
Saturation Voltage	V_{CEsat}		.07	0.5	V	$I_F=16.0\text{ mA}$, $I_C=2\text{ mA}$
Dark Current Leakage	I_{CEO}			500	nA	$I_F=0\text{ mA}$, $V_{CE}=5\text{ V}$
Trickle Current Leakage	I_{CEO}			1	μA	$I_F=5\text{ }\mu A$, $V_{CE}=5\text{ V}$

SSR Characteristic Curves

Figure 1. SSR recommended operating conditions

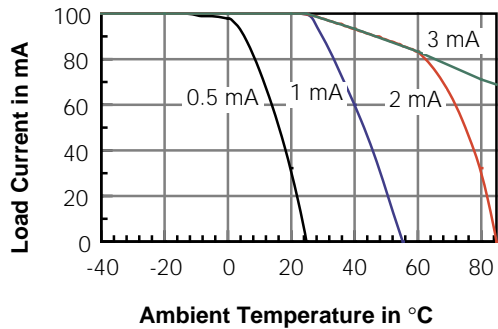


Figure 3. SSR turn-on current versus temperature

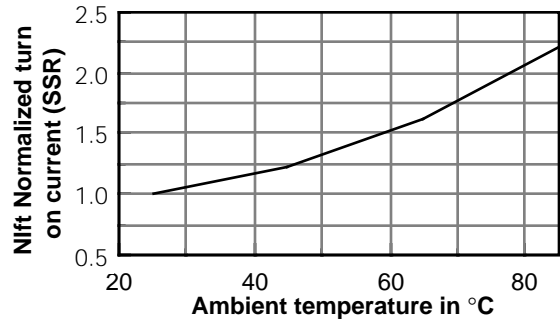


Figure 2. I_F versus V_F , typical

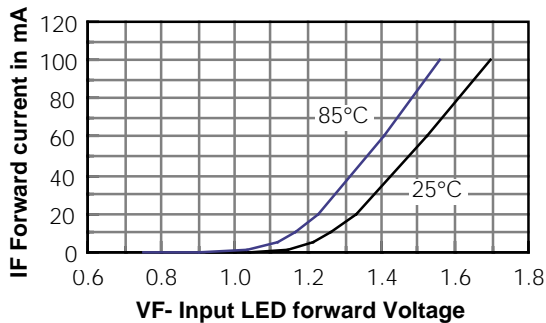


Figure 4. SSR current vs. voltage, typical

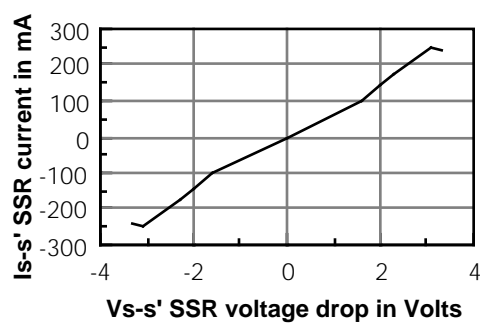


Figure 5. SSR turn on time versus resistive load

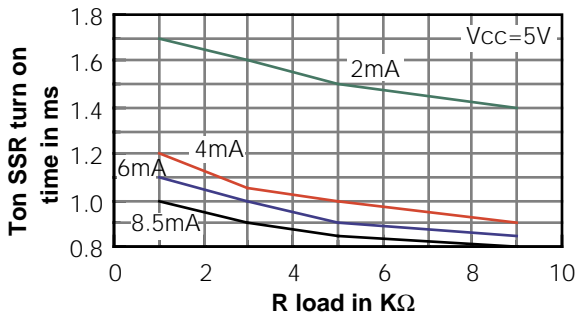


Figure 9. Saturated current transfer ratio, typical

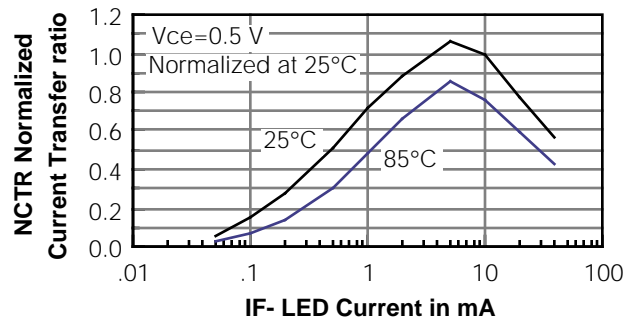


Figure 6. SSR current limit versus temperature

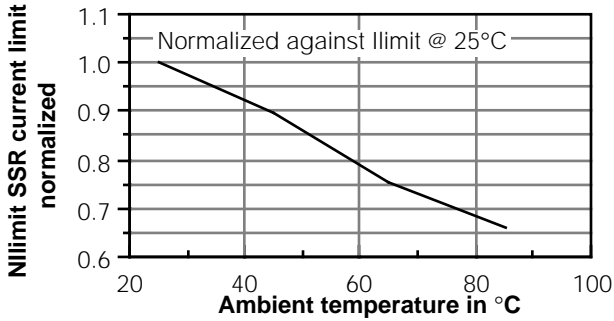
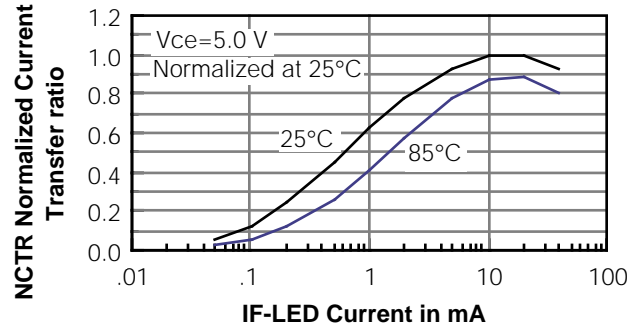


Figure 10. Non-saturated current transfer ratio, typical



Typical Opto Channel Characteristic Curves

Figure 7. Ic versus Vce, typical

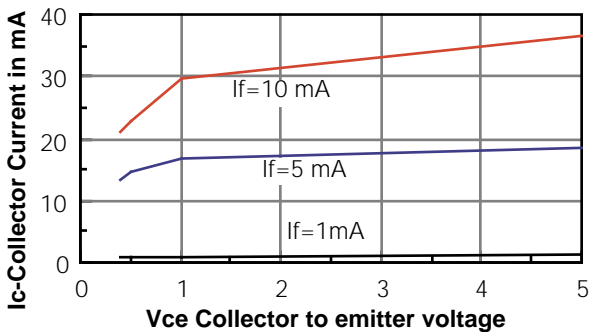


Figure 11. Switching test circuit for SSR channel

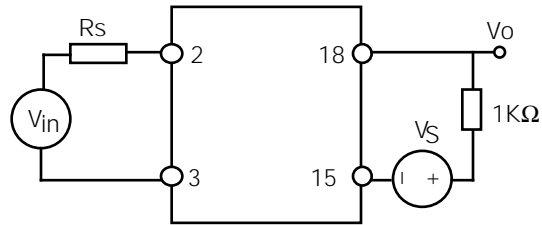


Figure 8. Iceo leakage current versus temp.

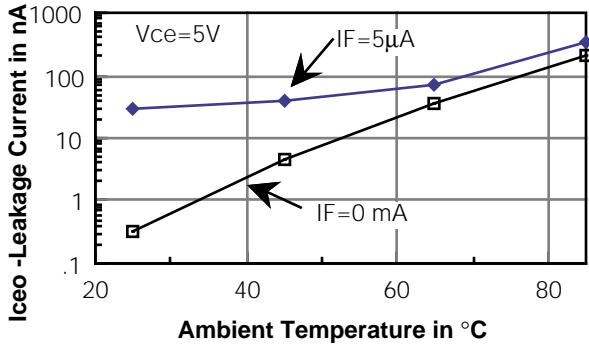


Figure 12. Switching waveform

